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AUTHOR Russell, Tom
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ABSTRACT

A teacher educator took over a high school physics teachers' class for a semester in exchange for the physics teacher taking over his university physics methods classes. The paper presents the perceptions of people involved in the experience. Students at both schools accepted the situation well. University students, invited to observe their university teacher at the high school, found it difficult to criticize his expectations as unrealistic, since he was out teaching high school every day. Some students felt free to criticize his teaching since they had been asked to observe; others hesitated because they were not used to criticizing teachers' work. Students had some difficulty finding value in repeated observations of one teacher. The teacher found student comments helpful. He decided that teaching one class a day while also teaching beginning teachers shifted his expectations for preservice education. He rethought the structure of preservice teacher education to make it more applicable to future classroom teaching. Three appendices offer an excerpt from a recorded after-class discussion with class observers, student comments showing different perceptions, and comments from a meeting with a graduate student who had videotaped a lesson. (SM)

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A Teacher Educator and his Students Reflect on Teaching High School Physics

Tom Russell
Faculty of Education
Queen's University
Kingston, Ontario K7L 3N6

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Well, I guess it's back to the 'crystal palace,' isn't it?
--science teacher on my last day at the school

INTRODUCTION

It had been 25 years since I last taught full-time in a secondary school, and it had been 14 years since I began my academic appointment in teacher education. With tenure in hand and enough teaching and research experience to "know the territory," what could I do to make life more interesting and push myself to re-examine my teacher education practices? During a year's sabbatical leave in England, where a different set of practices helped me rethink old assumptions, I decided to try to arrange to return to the secondary classroom as a physics teacher. A few letters to the people most likely to be interested was all it took; a physics teacher in Kingston agreed to an exchange of services in which I would teach Grade 12 physics for 76 minutes every day from September through January (a full semester's course) and he would teach one of my physics methods classes once a week for 120 minutes.

To link my teaching and teacher education activities, I invited the 27 physics methods students to come to the school to observe my class whenever their schedules permitted. Also, they were invited by the school's science department to observe as many teachers in the department as they wished. Two of the 27 were assigned to me and my school colleague for practice teaching placements of three and two weeks respectively in October and December. In addition, an M.Ed. student who was in my physics methods class three years ago and who returned to study full time after two years of physics teaching was a member of my graduate course in "the improvement of teaching." I invited him to use my teaching for his two required observations and interviews and he agreed. At the time I could not have anticipated how helpful it would be to discuss my teaching with someone who had two years' experience with the course I was teaching for the first time.

Through it all, I carried the daily responsibility for a class of 20 students following a curriculum guideline and textbook that were completely new to me from the perspective of day-to-day teaching. It was an adventure I will always treasure, but the going was not always easy. This paper is one part of my effort to share the experience with others as I also interpret it to myself.

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As I moved each day from teacher education institution to secondary school and back, I became very aware of the differences in the two settings. I had no interest in outright comparisons or efforts to say that one setting or the other was better or worse in some respect. "Culture" became the most useful metaphor; the two settings had quite different characteristics and basic values, each with advantages and disadvantages. Later I found it useful to extend the notion of "culture" to the various groups with whom I interacted each day: the physics students, the physics teachers in training, the science teachers at the school, the experienced teacher turned graduate student, and my teacher education colleagues. I found that my return to the role of physics teacher involved coming to terms with new perspectives on each of these groups.

PERCEPTION OF ROLE: THE MEDIUM SENDS THE MESSAGE

"That sounds risky?" was a common response when people heard of my plans to return to the physics classroom. "Will I be seen as effective, by students and by the school?" was a question I naturally asked myself. I had multiple audiences: the physics students, the beginning teachers, the experienced teachers at the school, and my teacher education colleagues. I was astonished at how quickly the physics students accepted me; on the second day of school, I was clearly the teacher. The teachers at the school were superb about helping whenever I asked, and also about leaving me alone to make my own mistakes when I lacked the good sense to ask, or was simply stubborn and determined to mess things up for myself. I could understand if they secretly hoped I would make a few mistakes; I certainly made both big ones and small ones, and at first I was an unpredictable interloper in some ways. On my last day in the school, it was a real compliment to have them wish me well "back at the 'crystal palace.'"

I did not anticipate that the beginning teachers would see me differently because I was teaching every day in a high school. Theirs was the one environment in which I felt at home, and so I failed to anticipate that I might not be seen as other classes of beginning teachers had seen me in previous years. More importantly, I did not anticipate the need to restructure the preservice teacher education experience in order to enable them to take advantage of what I was doing. Another time, I would work very hard to establish with them a "conversational mode for observation." The importance of this was driven home by one pre-service teacher who visited several of my classes just as the physics course was ending. When he came in to my office to talk about what he had seen, he gave me an analysis of "what I had done wrong" that was **exactly** like the analysis that I or any other teacher educator might have given to a student teacher whose lesson had just been observed. I treasure the experience because I saw just how "culturally driven" is this type of response to observation of teaching. I also wonder if we will ever overcome the "observer criticizes--teacher becomes defensive" mode of talk about teaching and develop the ability to **listen** to each other. I try to get beginning teachers to see the value of **talk about teaching** with a sympathetic professional, but the idea that one learns (rethinks, reframes, plans anew) from talking is foreign and the assumption that one improves by being told is deeply rooted in our culture and learned by everyone who attends school. Thanks to this teaching experience, I now understand why pre-service teachers cannot be simply asked to "observe."

One comment stands out among all the comments about the effect of my additional role as teacher: "It is interesting to note that the only person who wasn't telling us how to teach is the person who was teaching every day in a school." When the methods students knew I was teaching every afternoon, it was difficult for them to criticize me as unrealistic and uninformed. Anyone who offers specific recommendations for teaching runs the risk of such criticisms, and that may be why I have never been one to say "This practice is better than that" or "There is only one right way to do X." In noting this point, I do not wish to suggest that I have no opinions or beliefs about the

relative value of various teaching practices. But I do believe that the decision to use a particular practice is a personal and context-dependent one. The contrast between the way I found myself teaching the physics students and the way I try to explore various aspects of science teaching with the student teachers simply confirms my stance. So much of teaching is context-dependent, driven by a past and a future as well as the specific moment. The student teachers who saw me as engaged in daily teaching did not realize that it had never been my practice to offer detailed prescriptions for practice, but the contrast proved very helpful.

Underlying the student teacher's comment is a striking tension between the two cultures of teacher education and secondary school. Teacher educators are rightfully concerned about improving schools and it would be surprising if they did not recommend what theory and research suggest would be improvements. Teachers in schools are rightfully concerned about doing the very best teaching possible in the context of today's schools--"now," not tomorrow. While teachers must cover the prescribed curriculum and report marks to students and parents at regular intervals, teacher educators do not have a fixed curriculum and few people fail programs of teacher education. Herein lie the seeds of a very complex tension between "quantity" and "quality," and beginning teachers are quick to detect when teacher educators advocate strategies that have obvious qualities but would be quite difficult or impossible in the "cover and report" or quantity context of our schools.

OBSERVATION AND THE BEGINNING TEACHER

What is the role of observation in learning to teach? Years of case-study research in which I have observed many teachers and recorded conversations about their teaching led me to anticipate extended discussions about my own teaching with student teachers whom I normally come to know well over the teacher education year. Most of the teachers-in-training visited once or twice, but only occasionally did discussions ensue, and only when I initiated them. After all, why should someone new to the profession and quite accustomed to attending classes to learn a subject find it easy to switch to talking **about** teaching? Appendix A illustrates a portion of one after-class conversation with two of the beginning physics teachers.

One student teacher was perceptive enough to explain that as he approached his first practice teaching assignment he was looking at as many teachers as he could, not for things to discuss but for techniques that would help him teach. Thus it appears that would-be teachers have difficulty finding value in repeated observations of one teacher. If I continue to hope that multiple observations can be a useful procedure for connecting the two teaching contexts (secondary physics and pre-service physics), then I will need to provide more specific preparation and structures through which the pre-service teachers can find meaning in the study of one teacher and one class of students.

Over the year, the tension continued between the realities of "practice" and the ideals of "theory." The activities and recommendations of experienced teachers continued to differ from the messages sent by education professors. My daily teaching activities for the first half of the year made it much easier to bring that discussion of theory and practice into the "crystal palace" rather than pretending that it does not exist as a sharp contrast between practicum experiences and university classes. The student teachers were as aware as I was of the cultural contrasts between high schools and "the crystal palace" of teacher education.

RE-THINKING THE REALITY OF THE BEGINNING TEACHER

Our teacher education program at Queen's is probably similar to programs at many other universities. As elsewhere, our students tell us that practice teaching is the most important part of their program. Our arrangement of **four** practice teaching assignments over a total of **nine** weeks is probably as abbreviated a series of teaching placements as one could imagine; some might well ask whether this structure is even minimally adequate. Twenty weeks of university classes tend to drag at times, and there are numerous complaints about written assignments that are "hoops to jump through" rather than meaningful contributions to learning to teach.

Teaching one class a day while also teaching beginning teachers **does** shift the teacher educator's realities. It is no guarantee that what I do in my education classes will be meaningful and relevant, but it does help me to avoid saying things that are irrelevant from the beginner's perspective. It is too soon for me to know how I will modify my education classes next year, when I hope to again teach one class a day in the fall semester. I learned many valuable organizational strategies from my daily contact with secondary school students and teachers.

The 20 weeks of classes in the B.Ed. program at Queen's are punctuated by intervals of short practice teaching assignments. The first six weeks of classes occur **before** the first teaching placement, and quite consistently it has been my wish to have that initial period (30 per cent of on-campus program time) reduced, perhaps to three weeks. (The administrators always tell me that six weeks is the absolute minimum period required to assign 700 students to schools and notify the schools.) I seek such a reduction because the student teachers have quite different perspectives on what it is they are trying to learn after their first placement; until that point, they do not and cannot fully understand what it is they are trying to learn or what it is we are trying to teach them.

I am considering a number of alternatives. My school colleague, who taught the pre-service teachers each week for two hours, as I did, was very well received by the pre-service students. Now that we have both been "through the routine" once, we may be better able to plan and co-ordinate to complement each other. One potentially useful activity would be tutoring experiences, perhaps with two people assigned to a single student so that one could observe while the other tutored. This would introduce the beginning teacher to the nature of each student's efforts to come to terms with the course content before "taking the stage" in front of an entire class, a role that often precludes detailed knowledge of each individual as a lesson proceeds. I might also return to a scheme that seemed productive 10 years ago, sending student teachers in groups of three to observe a class with a view to returning a week later to share the presentation of a lesson. As an alternative to the familiar peer teaching, I wonder if it would be effective to have students take the same sequence of lessons that I am presenting and work in groups to prepare and present them to each other, with the same equipment and time frames that I am using in the school. This activity might stimulate their observations of my teaching of the same material.

RE-LIVING THE BEGINNING TEACHER EXPERIENCE:
You Can't Go Home Again, but You Can Reframe Professional Images

In some senses, I was a beginner; in other senses, I was not. The day-to-day details of the course were new to me; the surroundings were unfamiliar and I did not know what equipment was available or where to find it. I spent hours solving homework problems for the next day's classes, just as any beginning teacher must. But I already had "pedagogical content knowledge" of physics; there were moments when my classroom of 25 years ago reappeared in my mind during a particular topic or demonstration. I felt comfortable in a classroom in front of a group of people, and I had a

fair sense of what my options were as classroom manager. Experience got me through it, but there were enough new features to keep me on the edge of uncertainty. I have a completely reframed sense of why the first year of teaching is so utterly overwhelming for the beginning teacher.

Just as my return to the physics classroom reshaped my understanding of the learning that beginning teachers must accomplish, so did the experience force me to rethink science teachers' images of those of us who "teach people to teach." At times the schools that receive our student teachers for practice teaching speak as though teacher educators are not really teachers at all. I can accept that position more easily now, for university teaching of adults **is** different from teaching secondary school students. I now have a better understanding of this view of teacher educators, for I have been reminded that we have no fixed curriculum that is deemed essential and that must be covered before time runs out. In contrast, my overwhelming impression of the experience of returning to the secondary school physics classroom is an impression of rushing to cover the prescribed content "before time runs out." The result was a teacher quite different from the one I had become in the teacher education context, where I emphasize discussion of beliefs and experiences and strategies for capturing and interpreting details of initial professional experiences. "Back in the classroom," I was again "monopolizing the air time" in the hope that yet another explanation would break through some of the students' difficulties in taking on new concepts and applying them to specific questions and problems in the textbook and on quizzes and tests.

One way in which my previous experience teaching in high school and university contexts appeared in my teaching took the form of occasional invitations to the high school physics students to give me "backtalk" about my teaching. I collected several types of written comments as weeks went by, and I was pleased when the students became accustomed to my passing out blank pieces of paper for their comments. Appendix B gives voice to some of the students when I asked them to react to a lesson that had seemed to me to be quite unlike most of my previous interaction with them.

BEING OBSERVED BY BEGINNING AND EXPERIENCED TEACHERS

One of the many powerful contrasts I experienced came in the context of being observed by different people with different backgrounds and roles. The visits by student teachers did lead to interesting discussions, but only once did I receive extensive comments about my teaching. On that occasion, a student teacher with a strong personal commitment to inquiry and discovery came into my office after watching one of my classes and proceeded to tell me very directly that "students are different from the last time you taught" and suggested that I needed more diversity and activity in my lessons. More than anything else, I realized that here was a student talking about my teaching in exactly the same way that I or my colleagues (or any supervisor of teaching) might speak to a student teacher about a single lesson that had just been observed.

My teaching colleague in the school never formally observed my lessons but he was occasionally in the room when I was teaching. There was one point about seven weeks into the semester when he sensed that some of my practices were different from his. We had a discussion about those differences and I accepted his invitation to observe one of his classes. That experience was probably an inevitable stage in two professionals coming to work together as closely as we were, with my undertaking to teach at his pace, in his classroom, using his equipment. The discussion properly reminded me that he had valid and very important concerns about the preparation and encouragement of students who will go on to take the second, pre-university physics course in their final year at school.

In bold contrast to the occasional and unstructured discussions of teaching were the observations and discussions with the full-time graduate student who was using my classroom to collect data for one of his courses. Here we videotaped each lesson and a transcript of each lesson was produced. Then we separately examined the data before meeting to discuss it and plan another observation. This was the context in which I came to realize that I was giving vague and unclear responses to student contributions, and the result was a very clear change in my teaching that I came to feel was very helpful. I have no idea where the initial "tendency not to respond" came from, but it felt much better when I was aware of it and able to develop ways to signal to students that their comments had been heard and valued. Appendix C illustrates some of our discussion of this aspect of my teaching.

POSTSCRIPT: ADDITIONAL PAYOFFS

My son attends the school where I taught, and he is a year younger than most of the students in my class. Before he knew of my plans, I was concerned that he might not be pleased with my daily presence in the school. He accepted the news well and my presence proved convenient in a number of ways. I valued gaining firsthand knowledge of the workings of his daily school environment.

From the very first class, I was aware of three young men who seemed to be good friends, but I had no evidence about the background of their friendship. Once basketball season began, my son joined the team on which the three were also players, and I quickly realized why these three had been a strong sub-group in my class. Going to basketball games to see my son play became a valuable opportunity to connect to another side of the lives of some of my students.

Parents' night was an event I anticipated eagerly, recalling how important contact with parents had been many years ago. Only five of the 20 students had parents come to see me, and in retrospect it was hardly surprising that the first two fathers are also members of the university faculty, perhaps curious to meet this new teacher from the university setting. Then came the mother of the student who was at the top of the class from start to finish. Just before the evening ended, I spoke with the mother of the student who was my most vocal "conscience," always quick to call my attention to any practice of mine that did not make sense to him (as in "Why do we have to copy this diagram from the textbook into our lab report?"); she quickly assured me that her son had been asking "Why?" from a very early age. Contact with parents is missing from work with student teachers, and the opportunity to interact again with students' parents was welcome.

REFLECTION-IN-ACTION

Through my years of education courses and through my research, I have forced myself to seek, listen to, and accept "back talk" about my teaching. I probably overdo it at times. But I am accustomed to unexpected messages from virtually any source, and I have come to accept them as important opportunities to "reframe" my views of my work rather than as occasions to "hastily cover up and get on with it." It is tragically easy to react to teaching on a day-by-day basis rather than over the long haul. Certainly there were times when I was aware that I was "going through the motions" each day, not really getting a grip on significant issues in my teaching.

I have a longstanding interest in the process that Schön (1983) describes as "reflection-in-action" and I would argue that there were significant elements of that process in my five month experience. As I continue to teach the pre-service methods course, the various issues

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that arise prompt me to make notes about "next year" if I repeat the arrangement followed this year. The process definitely works in both directions. The reality of the secondary school science classroom became an important source of perspectives as I planned my work with beginning teachers. Similarly, the many ideas that come my way from "theory" and research compel me to question school practices even as I participate in them. Through it all, the terms "uncertainty," "ambiguity," and "value conflict" took on powerful new meanings.

A number of new frames about teacher education emerged during and since the 80 physics classes last fall. They have implications that I expect to see displayed in the actions of my teaching next year--with the high school physics students, with the student teachers in physics, and with the graduate-student experienced teachers studying the process of discussing teaching with a colleague.

- The "pressure to cover the curriculum" is powerfully real for beginning and experienced teacher alike. Teacher educators' recommendations that downplay or ignore that reality will certainly be viewed skeptically by teachers.

- Beginning teachers have watched so much teaching that they have little difficulty stepping to the front and beginning to act the teacher role; planning, questioning, writing tests, and the like develop with experience and guidance. But they need to be encouraged to observe and talk about a series of lessons by one teacher. It is much easier to move from one teacher to the next and observe the superficial differences than to dig deeply into one teacher's style and the differences among the students in a single class.

- As I move from school to school to observe student teachers, the things I notice and the issues I discuss are influenced by the recent experience of teaching and the possibility of teaching again next fall. I find myself making notes about things to try differently, not necessarily as someone has just done it but in a way that makes sense to me now that a related event has brought a practice to my attention.

- Now that I have a set of videotaped lessons and discussions of my own teaching, I am in a much better position to illustrate what is expected in the graduate course that examines classroom practices from the perspective of teacher and teacher-observer.

- Moving between and among "sub-cultures" of teaching and teacher education, I am regularly reminded of the effect of program structure (to which Richert, 1992, so powerfully calls attention). The teaching experiences last fall and the ensuing discussions with student teachers have highlighted several aspects of our program for beginning teachers. The present structure implies that one can only teach after being told how to teach, and it downplays the role of experience in learning to teach. Students are now suggesting to me that it might be more useful to have experience followed by course work.

This list of shifting frames is not a complete list, but it is indicative of the payoffs--present and future--that were associated with my first experience of combining teaching and teacher education on a daily basis.

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My first acknowledgement must be to the school and teachers who made it possible for me to return to the classroom; very special thanks go to the teacher who gave me one of his classes and agreed to share my methods class work at the university. David Beckstead, who observed, videotaped and discussed three lessons with me during the time I was teaching physics, has helped me with this first summary of the overall experience. The School of Graduate Studies and Research at Queen's University contributed to the costs of attending the conference to present this paper.

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Telephone: 613-545-6260

Fax: 613-545-6584

Bitnet: RUSSELLT at QUCDN.QUEENSU.CA

APPENDIX A

On several occasions the tape recorder was running during an after-class discussion with visitor-observers from the physics methods class. One excerpt from a recorded discussion demonstrates that interesting issues did arise in the context of observation. The pre-service teachers are designated (1) and (2), while my own contributions appear in upper-case. This excerpt also refers to the payoff the student teachers felt about having a full-time physics teacher work with them once a week.

(1) Can I ask a question that stems more from my other questions, but aren't you supposed to put the questions that you perceive as easiest at the beginning when you do a multiple-choice? AHH--HOW DO YOU TELL? (2) Yeah, I suppose. I MEAN, I HEAR WHAT YOU'RE SAYING ON THE ONE HAND. (1) Any question's a fair question but--some obviously are going to be a little bit easier than--)

(2) But that's--maybe you'll do that if you use those same multiple choice again. With the data you have you can do that now. But I see what you're saying. What you considered an easy question and what they got are two different things--

THE MARKING AND THEIR RESPONSES TO IT DRIVES ME CRAZY. I MEAN IT'S "RIGHT ANSWER," "RIGHT ANSWER," "RIGHT ANSWER." THAT HIT ME HARDER THAN ANYTHING ELSE BECAUSE I'VE HAD THE JOY OF WORKING WITH--WELL, WITH MASTERS STUDENTS IT'S--THEY'VE GOT EXPERIENCE--THEY KNOW WHAT THEY'RE TALKING ABOUT--THEY'RE WILLING--THEY OPEN UP TO ALMOST EVERYTHING. YOU PEOPLE ARE IN THAT TRANSITION THIS YEAR; YOU'VE NOTICED THAT THERE'S PASS AND HONOURS AND FAIL [the B.Ed. program marking scheme], BUT--

(2) It's very foreign to us!

IT'S FOREIGN TO YOU, AND IT'S--YOU KNOW, YOU ROLL IT INTO THE FACT THAT IT'S SO FUZZY AS TEACHER EDUCATION ANYWAY, AND "SO WHAT? HOW ELSE COULD THEY DO IT? HOW COULD THEY GIVE ME A C, ANYWAY?" BUT THE MARKING SIDE FOR ME REALLY TURNS--IS WHAT TURNS THE CRANK ON THE "COVERING THE CURRICULUM" AND SO ON. AT TIMES I FEEL LIKE I'M JUST WINDING IT ALL UP AND TURNING OUT THE MARKS, YOU KNOW--THAT'S THE WAY IT IS. I WANT TO DIG FARTHER WITH PEOPLE LIKE G_____, BUT IT'S NOT EASY.

(2) There's a balance somewhere there if you can get at it.

WELL, I DON'T KNOW. I WANT PEOPLE TO TRY TO KEEP IT ALIVE AS LONG AS THEY CAN. I'VE KEPT IT ALIVE BUT THEN IT'S NOT BY BEING IN A HIGH SCHOOL.

(2) Yeah. That's what I found was interesting about having [the full-time physics teacher] in, talking to us, because we were asking him questions and he was very honest about it. Because you might ask, actually, "How do you, like, justify the balance between the quantity you're teaching and the quality of the teaching you're getting?" He was very honest in what he said: "you try and do the curriculum. You do the best you can to put as much quality teaching in but you follow the curriculum." In other classes [in the Faculty of Education] they're telling us, "Oh, no. You can never sacrifice the quality of the teaching. The quality of the teaching is--" which I agree with, within the system. The only thing, if I'm teaching a class--like, I want to give them as much quality

teaching as possible, but I don't want them to come out of my class, go into the next year, and be lost.

APPENDIX B

My class on November 13 seemed quite unlike any that had occurred since school opened. Previous lessons had introduced topics such as the force on a current-carrying conductor in a magnetic field, and it was time to explain how motors work and how AC and DC motors differ in structure. There was a large demonstration motor available, and as I finished preparing for class I photocopied diagrams from the textbook and brought them together on a single page so that they could be compared more easily. The entire 76-minute lesson was devoted to answering their questions by pointing to the demonstration model and to the diagrams. I was so impressed by the different "feel" of the class that I asked the students to write responses to the question, "Was class on November 13 'different'?" The following comments show that the students' perceptions differed considerably; I was pleased to find them so able to express their reactions.

- More useful because we could ask questions, so you end up understanding the concept. Different-yes.

- Somewhat boring; not sure what I learned.

- Very enlightening and helpful because we actually talked and related questions to the topic.

- Everything was explained well so that I knew what we were talking about and how it works and the difference between AC and DC. This unit has been the best so far!

- Very informing because we were able to ask unusual questions and it turned out that these questions helped a lot in understanding the motor theory.

- Extremely informative: By listening to the questions, I now have generators all worked out in my mind.

- The last few days I'd swear you were speaking Greek! That's about how much I grasped of it. Yesterday I think I learned the whole unit in one hour. It really helped me a lot and I think I understand it fairly well now.

- I must have been conked out yesterday, because it seemed to be exactly the same as every other! Please--tell me how YOU thought it was different!!

- Everything you said went at least a couple feet over my head.

Even though many students agreed that the class had been different and "better," the lesson did not leave everyone with a sense of understanding. The diversity of reactions is one of the reasons why "prescriptions" about teaching practices seem so unlikely to succeed. And this episode illustrates my personal belief that "backtalk" from one's clients remains a central key to the reframing that leads to improved teaching.

APPENDIX C

The following comments are taken from the transcription of my conference with graduate student David Beckstead after his first videotaping of one of my lessons. The comments illustrate my responses to, and our discussion of, his suggestion that something interesting is happening (or not happening) in the way I respond to student answers that are not correct or that do not contribute to the flow of the lesson. (My comments begin with T; Dave's comments begin with D.)

T: . . . but the way in which I specifically respond to questions--I'm obviously trying to avoid saying "no". We've got several instances of it.

D: Yeah, well that's the art of teaching; never say no. I guess the second part is building in your responses specifically addressing exactly what they said, so perhaps they feel part of the ultimate--

T: Yeah, I don't actually buy that, personally--the notion that they feel like they've helped create it. I think the overall pattern that I'm--I get to talk every other time, and I get much longer speeches that anyone else, sends the overall message that "I'm telling and you're taking." So I don't--

D: You don't think it works within this context that describes student response?

T: I don't subscribe to the notion that they get any sense of ownership out of what I say here, by that, but I do think--I'm very much interested in the notion that I need to--I need ways of responding to questions that are "not right" that are other than changing the subject or launching off into something without saying anything about the answer.

D: Do you think the concept important when someone offers up something like this, that is part way there, and also part of a perhaps common misconception that specifically needs to be addressed?

T: Yes. I would have been much happier if I had seen myself say, "That's exactly what we would expect if we . . ." You know--just the first, quick slice at it--that would be our first guess, that there is a relationship there at all, and then go on from there. David offered a comment on the preceding discussion: "Here, I feel the earlier awkwardness occurring at the beginning of the conference has been replaced by a simple exchange of ideas. Even though the viewpoints don't coincide, they were offered in what I felt was a very relaxed and professional atmosphere. This prevailed until the conclusion of the conference."

T: I am running short now. Did you see similar patterns? My speeches got shorter for a while there.

D: Yeah, a lot more interaction. This is what a standing wave is. I wasn't sure if this question got specifically addressed.

T: So one of the themes that's coming up here is, do I respond to their questions, or do I make a guess as to what they mean and launch off somewhere from there?

D: Hmm. There's always a response that indirectly applies to the question, but I'm just wondering if they lose the thread. You can see it here [pointing to transcript of lesson].

T: But I think we've definitely got a focus here, and that is "the response I make to students' answers."

D: O.K. Last one here is probably this: I guess you're not big on the idea of reinforcement? But I thought this answer was really sort of excellent, and coming from a person I hadn't heard from. Not necessarily reinforcement, but did it need a tiny bit more development? In other words, it's been put up; could you add something to that?

T: I could have at least said, "Thank you, G_____. I couldn't have asked for a better answer." It would have given him some indication that it was appreciated. He is very "on the ball." So I can at least ask myself--this gives me the opportunity to think about the issue of reinforcement of answers.

D: Yeah. Some people--I had a person who drove it into my head in a teaching round, and I never really thought very much of it specifically. I think of reinforcement that, if someone throws something up, and it's a good answer, then maybe it's just worth sitting on for a second just before moving on--just so--perhaps it's a little more legitimized as a valid sort of response. Suddenly it's become part of the discussion. Time permitting, of course, there's a lot of other factors.

T: What will also be interesting will be to see, first of all, can I get control of this? But then, will we see any differences in the students? We may or may not.

D: Yeah. The whole thing here is we're trying to address a bigger problem, and I don't know how to go about addressing that, and I don't have much faith in these tiny, little things here as addressing the bigger problem. "What does it all mean?" type of stuff. I guess we'll have to see, but I can't think of--given time, you know, how else can we go about it?

I closed this conference about my teaching with the following comment:

T: Thank you. The usual feeling--as if I didn't have enough things to get on top of--but I feel really, really good about what we've seen here. And I read through it [the transcript of the lesson] and whatever I was reading for, I didn't notice that at all. And I mention that only to say, picking this up in the midst of 100 other things going on, one can just read it. I absolutely believe in the notion of having somebody to talk about it with, and that just reinforces it in spades. Thank you. More soon!